

CLAIMS:

1. A method of producing a ceramic assembly, comprising:
disposing an electrode precursor on an electrolyte precursor having an electrolyte sintering shrinkage;
disposing a stabilizer precursor having a stabilizer sintering shrinkage on the electrode precursor on a side opposite the electrolyte precursor to form a precursor assembly, wherein a difference between the electrolyte sintering shrinkage and the stabilizer sintering shrinkage is less than or equal to $\pm 1\%$; and
sintering the precursor assembly to form the ceramic assembly comprising a stabilizer layer, electrode, and electrolyte, wherein a surface of the ceramic assembly has less than or equal to about 5.0 degrees camber, as measured from the horizontal plane.
2. The method of Claim 1, wherein the stabilizer layer has a stabilizer thickness of less than an electrode thickness
3. The method of Claim 2, wherein the thickness is about 3 micrometers to about 15 micrometers.
4. The method of Claim 3, wherein the thickness is about 3 micrometers to about 10 micrometers.
5. The method of Claim 4, wherein the thickness is about 5 micrometers to about 8 micrometers.
6. The method of Claim 1, wherein the stabilizer layer has a porosity of less than or equal to about 10%, and wherein fluid communication through the stabilizer layer to the electrolyte is through openings in the stabilizer layer.
7. The method of Claim 6, wherein the openings extend from one side of the stabilizer layer to an opposite side and comprise holes.

8. The method of Claim 7, wherein the holes are in the pattern of a grid.
9. The method of Claim 6, wherein the porosity is less than or equal to about 5%.
10. The method of Claim 9, wherein the porosity is less than or equal to about 1%.
11. The method of Claim 6, wherein the stabilizer layer covers less than or equal to about 95% of the electrode.
12. The method of Claim 11, wherein the stabilizer layer covers about 30% to about 90% of the electrode.
13. The method of Claim 6, further comprising disposing an elastomer on the electrode precursor in a desired pattern prior to disposing the stabilizer precursor on the electrode, wherein the elastomer forms the holes in the stabilizer layer.
14. The method of Claim 1, wherein the stabilizer layer has a porosity of greater than or equal to about 20%, and wherein fluid communication through the stabilizer layer to the electrolyte is through pores.
15. The method of Claim 14, wherein the porosity is about 20% to about 60%.
16. The method of Claim 15, wherein the porosity is about 40% to about 60%.
17. The method of Claim 15, wherein the stabilizer precursor comprises a fugitive material.

18. The method of Claim 1, wherein the stabilizer layer and the electrolyte layer comprise the same material.

19. The method of Claim 1, wherein a difference between an electrolyte coefficient of thermal expansion and a stabilizer coefficient of thermal expansion is less than or equal to about $\pm 5\%$.

20. The method of Claim 19, wherein the difference is less than or equal to about $\pm 3\%$.

21. The method of Claim 20, wherein the difference is less than or equal to about $\pm 1\%$.

22. The method of Claim 1, wherein the camber is less than or equal to about 3.0° .

23. The method of Claim 1, wherein the camber is less than or equal to about 1.0° .

24. The method of Claim 1, further comprising applying an electrically conductive material to a side of the stabilizer layer opposite the electrode.

25. The ceramic assembly formed in accordance with the method of Claim 1.

26. A method of producing a solid oxide fuel cell, comprising:
disposing a first electrode precursor on a solid electrolyte precursor having an electrolyte sintering shrinkage;
disposing a stabilizer precursor having a stabilizer sintering shrinkage on the first electrode precursor on a side opposite the electrolyte precursor to form a precursor assembly, wherein a difference between the electrolyte sintering shrinkage and the stabilizer sintering shrinkage is less than or equal to $\pm 5\%$;
disposing a second electrode precursor on a side of the solid electrolyte precursor opposite the first electrolyte; and
sintering the precursor assembly to form the ceramic assembly comprising a stabilizer layer, first electrode, and electrolyte, wherein a surface of the ceramic assembly has less than or equal to about 5.0 degrees camber, as measured from the horizontal plane.